

## **Annual Invasive Species Report March 2015**

The Michigan Department of Natural Resources (DNR) compiled this report to satisfy the requirements of Michigan's Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended, MCL 324.41323. This report provides current information and recommendations on invasive species ("transgenic and nonnative organisms") throughout the state of Michigan. Part 413 was developed as a preventative measure to stop the introduction and further spread of invasive species in Michigan. Included in the legislation is a list of prohibited and restricted species. This list acts as a first line of prevention and awareness, with other supporting activities strengthening this effort. To continue these preventative efforts, the DNR recommends that the list of prohibited and restricted species be maintained and enforced. Collaboration between multiple state agencies and divisions allowed for the completion of this report.

The format for this report follows the order from MCL 324.41323. Per MCL 324.41323, the DNR shall make recommendations on all of the following:

### **Additions/deletions for Prohibited and Restricted Species Lists**

In 2013, The Council of Great Lakes Governors and the Premiers of Ontario and Quebec established a list of "*Least Wanted*" Aquatic Invasive Species (AIS). The DNR recommended adding the invasive species on the "*Least Wanted*" list to Part 413 as prohibited species, if not already listed.

In 2014, the DNR and Michigan Department of Agriculture and Rural Development (MDARD) consulted and moved forward with the 2013 recommendations by harmonizing the prohibited and restricted species list for the state of Michigan with the Council of Great Lakes Governors and Premiers' list of "*Least Wanted*" AIS. As of January 2015, the state of Michigan has prohibited all species listed on the "*Least Wanted*" list, in addition to red swamp crayfish, which is an invasive crayfish species of concern.

In addition to adding species to Part 413, Public Act 537 of 2014 was enacted. Act 537 of 2014 requires that all Lacey Act animals be listed as prohibited and that all animals in commercial trade as of January 2015 be reviewed for listing as prohibited, restricted, or approved within two years. This new act will aid in AIS prevention efforts. The DNR has initiated efforts to address the new requirements set forth in Act 537, but additional training is recommended for staff on conducting risk assessments. The DNR further

recommends that workshops be conducted with members of the animal and plant trade industry.

### **Status of Various Prohibited Species and Other Problematic Species**

Table 1 at the end of this report shows the primary species of concern for Michigan that are currently listed as prohibited or restricted under Part 413. Additional laws and regulations pertain to broad taxa rather than individual species (e.g. stocking of spawn or fry of any fish species) but are not included here. The current distribution in Michigan, based on best available knowledge, is provided for each listed species. Note that some species in the table are absent (or thus far undetected) in Michigan. This coarse-scale distribution is intended to provide a basic snapshot of where each species exists along the invasion curve. Some of these species are not yet known to be present within the state, while others have been present in certain parts of the state for decades, causing significant ongoing management and control costs. In cases where distribution is listed as absent, this may mean a particular species is truly not present at all in Michigan or that no confirmed detections have been made.

#### **Other Problematic Species**

##### **Mute Swan (*Cygnus olor*) - Widespread**

The DNR recommends continuing and increasing mute swan control efforts over the next 20 years to significantly reduce mute swan numbers throughout Michigan. The DNR recommends that the mute swan population continue to be monitored and evaluated annually to determine the appropriate classification.

##### **Hemlock Woolly Adelgid (*Adelges tsugae*) (HWA) - Absent (isolated occurrences in the past)**

HWA has been detected in five counties in Michigan since 2006 (Emmet County in 2006, Ottawa and Macomb Counties in 2010, Berrien County in 2012, and Allegan County in 2013). Michigan maintains an external quarantine for HWA.

##### **Oak Wilt (*Ceratocystis fagacearum*) - Widespread with isolated occurrences**

Oak wilt is widespread in the Southern Lower Peninsula, with spotty distribution in the Northern Lower Peninsula and Upper Peninsula. Many treated areas in Menominee and Dickinson counties remain free of oak wilt. The DNR recommends review of movement restrictions on forest products to ensure that all prudent precautions are being taken to avoid spreading oak wilt via this vector, and to assess the effectiveness and impacts of these restrictions.

##### **Beech Bark Disease (*Neonectria sp.*) (BBD) – Widespread**

Since the discovery of beech bark disease in 2000, this invasive disease has spread through Michigan's forests, causing widespread mortality in beech trees.

White-nose Syndrome (WNS) (*Psuedogymnoascus destructans*) (Pd) - Isolated

In 2014, WNS was confirmed in five Michigan counties: Alpena, Dickinson, Keweenaw, Mackinac, and Ontonagon. These are the first confirmed cases of WNS in Michigan. Die-offs of Michigan bats were confirmed in January 2015. Known hibernacula are closed to the public to help prevent the spread.

Sea Lamprey (*Petromyzon marinus*) - Widespread

Sea Lamprey are established in Great Lakes waters and known to be harmful to native fish populations. The DNR recommends continued support of the U.S. Fish and Wildlife Service (USFWS) Sea Lamprey Control Program.

**Preventing the Introduction of and Controlling or Eradicating Invasive Species**

Preventing new introductions is the most cost-effective way to manage invasive species. Controlling the spread of existing invasions limits the damage they cause. Invasive species can be unintentionally spread by people, equipment, management practices, and through contaminated material such as fill or mulch. In 2014, the Quality of Life (QOL) departments approved a decontamination policy requiring all staff to implement decontamination protocols for preventing the spread of invasive species. Each department was tasked with developing recommendations for implementation of this policy for their staff.

A variety of other efforts are ongoing around the state of Michigan that are aimed at preventing new introductions of invasive species and controlling existing invasions. The following are summaries of the most relevant efforts:

**Preventing Asian Carp in Michigan Waters**

In 2014, DNR Fisheries Division took multiple steps to increase awareness and evaluate protocols for preventing Asian carp in Michigan waters. The prevention of bighead and silver carps is a top priority, and Fisheries Division has continued to test locations at risk of invasion for the presence of Asian carp species. Specifically, environmental DNA (eDNA) sampling has continued, staff training has increased, and education and outreach materials have been developed and widely distributed.

Fisheries Division recommends the following for the prevention of Asian carp in Michigan waters:

1. Continue early detection sampling through the use of eDNA testing in locations on the high priority list, which was generated by Fisheries Division in 2012 and has been continually updated since then;
2. Continue to increase staff training in methods that are effective at detecting and capturing Asian carp;
3. Continue to evaluate response options and control technologies for use in the scenario that an Asian carp is reported; and
4. Support hydrologic separation in the Chicago Area Waterway System, which is the pathway with the highest risk for the spread of Asian carp.

### **Early Detection and Rapid Response**

The most effective and efficient means of reducing the impact of invasive species beyond prevention is to respond efficiently to new invasions or existing outlier populations. Even the best prevention program cannot keep all invasive species out, but a program that responds quickly, uses cost-effective methods, and engages key stakeholders will minimize the threat of invasions impacting Michigan.

The Council of Great Lakes Governors and Premiers developed a Mutual Aid Agreement (MAA) for combating AIS, which was signed in 2014. The MAA is designed to: 1) prevent the introduction and spread of AIS; 2) foster mutual aid among the states and provinces to respond to serious threats in the basin from AIS; and 3) encourage further cooperative actions by the states and provinces to combat AIS. Given the multi-jurisdictional nature of AIS, the DNR recommends working collaboratively with regional partners to implement the MAA during AIS response efforts, when such actions are warranted. The implementation of the agreement by various state agencies will lead to better regional partnerships and a more comprehensive response. In addition, these types of multi-agency responses will likely increase the already growing support and collaboration among AIS programs.

The DNR Fisheries Division partnered with the Ohio DNR to plan, organize, and implement the MAA during the 2014 Lake Erie Asian Carp Response Exercise. This exercise illustrated the utility of the MAA and the regional dedication to AIS responses. The successful three-day exercise included approximately 60 participants, representing 10 different agencies, in an attempt to capture grass carp.

The DNR Wildlife Division is currently leading a Great Lakes Restoration Initiative (GLRI) grant project for Early Detection and Rapid Response (EDRR) for aquatic invasive plants in Michigan. After four years, the EDRR program has verified 96 unique detections of six new high-threat aquatic invasive plant species in Michigan. Prioritized response efforts have occurred at 28 sites. The DNR recommends continuing and

expanding the state's capacity to respond to reports of new high-threat aquatic and terrestrial invasive species.

### **Phragmites Control**

The DNR continues to conduct control activities on hundreds of acres of invasive Phragmites across dozens of state game areas, parks, and forests using ground and aerial herbicide treatments. Many treatments were conducted with neighboring landowners and partner organizations, such as Cooperative Invasive Species Management Areas (CISMA) and Ducks Unlimited. Large-scale efforts were concentrated at Waterfowl Management Areas and southern state parks. Additionally, the Phragmites Treatment/Management Prioritization Tool is available online to help management groups prioritize the treatment and management of invasive Phragmites in Michigan. This tool helps regional and state land managers with limited funding and resources determine which Phragmites populations to target within their management areas.

### **Prohibited Swine Control**

Much of the time and money spent by the DNR on prohibited swine is currently attributed to lawsuits associated with the Invasive Species Order.

Current feral swine control and eradication efforts are ongoing. The DNR and United States Department of Agriculture-Wildlife Services (USDA-WS) exchange reports about feral swine and coordinate lethal removal efforts. The DNR has initiated a public education campaign to increase public awareness about feral swine and facilitate increased reporting. The DNR has also worked with partners to ensure that outdoor enthusiasts receive information from their peers, as well as the DNR. These efforts will increase in FY 2015. A partnership was formed between the Michigan Wildlife Conservancy (MWC), USDA-WS, MDARD, and the DNR to provide traps and bait to landowners. The MWC created a statewide feral swine training and trapping program to educate people about the deleterious effects of feral swine and how to properly build and use a feral swine trap.

In October 2013, a research project involving the DNR, Michigan State University (MSU), USDA-WS and the University of Michigan-Flint commenced to advance understanding of the habitat, breeding ecology, and diseases of feral swine in Michigan to inform effective management. The information that has been collected from this project is already being incorporated into lethal removal efforts by USDA-WS.

## **Emerald Ash Borer Control**

Since its identification in 2002, the emerald ash borer (EAB) has killed an estimated 50 million ash trees in the Lower Peninsula of Michigan and surrounding states. The DNR and MDARD have conducted EAB work in conjunction with a federally-funded EAB response project, initiating the following actions:

- Michigan's EAB Interior State Quarantine was last revised on January 7, 2014.
- MDARD staff renews and issues intra-state compliance agreements (CAs) as necessary. A CA is a written agreement between a person moving or receiving regulated articles and MDARD. MDARD maintains approximately 125 CAs with receivers, brokers, and shippers and conducts compliance inspections with CA holders.
- MDARD staff writes phytosanitary certificates for ash lumber being shipped internationally.

USDA Animal and Plant Health Inspection Service Plant Protection and Quarantine program conducted trapping at 230 sites in 2014 using a contractor. All non-quarantined counties of the Upper Peninsula were included in the survey. All traps were negative for EAB.

The DNR recommends continued support of prevention, early detection and rapid response, regulatory efforts, and the release and establishment of biological organisms for long-term control if and when they become available.

## **Restoration/Remediation of Damaged Habitats**

The DNR engages in many large-scale restoration projects using a variety of tools to repair damaged habitats once invasive species are controlled. The following are recommendations for continued restoration and remediation efforts:

- Continued use of prescribed fire and water control structures as management tools to guard against future re-invasions;
- Reintroduction of native species where regeneration cannot be attained with restoration techniques;
- Continued replacement of important forest species affected by invasive species through harvest prescriptions and replacement with desired species; and
- Continued support for native fish populations in areas affected by invasive species through native fish stocking and other techniques.

- The DNR recommends that the state of Michigan promote the production and use of Michigan grown weed seed-free products (e.g. weed-free mulch).
- Michigan should promote the use of weed-seed free fill dirt and gravel for projects on state and private land to minimize the spread of invasive plant species such as Phragmites, spotted knapweed, and Japanese knotweed.

### **Prioritizing Efforts to Prevent Part 413 Violations**

It is the goal of the DNR and MDARD to prevent the introduction of prohibited invasive species through education, detection, and interdiction. This proactive effort is ongoing and being accomplished through outreach and increased inspections of businesses associated with invasive species by both departments.

DNR Law Enforcement Division (LED) leads this effort with education of law enforcement agencies, user groups, and business owners. In addition, this effort is being accomplished through vigorous investigation of information cultivated regarding the illegal possession, transportation, or commercialization of prohibited species. These efforts of outreach, education, and enforcement are critical to preventing the introduction of invasive species. The DNR recommends that these efforts are continued in order to protect Michigan's citizens, resources, and economy.

The following are ongoing efforts by the DNR LED to prevent Part 413 violations and address invasive species issues:

1. The Great Lakes Enforcement Unit represents LED as a member agency of the Asian Carp Task Force coordinated by the USFWS. The task force is comprised of state, federal, and provincial law enforcement agencies cooperating to enforce regulations pertaining to the sale and movement of Asian carp. The exchange of information and combined enforcement efforts has enhanced LED's ability to detect, interdict, and prosecute for violations of transporting and marketing Asian carp and other prohibited species. In addition, the task force members are contacting businesses dealing in Asian carp, educating them in state and federal regulations regarding the fish in their respective states and provinces. The Great Lakes Enforcement Unit has provided training and training materials to task force agencies to train officers in the identification, detection, and interdiction of Asian carp. These cooperative efforts have resulted in the expansion of enforcement efforts across state and international borders, enhancing the ability to stop illegal shipments of Asian carp and other prohibited species from reaching Michigan. The cooperative efforts of the Great Lakes Enforcement Unit, USFWS, and National Oceanic and Atmospheric Administration Office of Law Enforcement

resulted in the successful prosecution of an Oregon-based company violating a Fish Disease Control Order. In 2014, the company illegally marketed Pacific herring bait for Great Lakes fishing, potentially introducing Viral Hemorrhagic Septicemia into Michigan waters.

2. LED Conservation Officers continue to interact with the public via sport club meetings, sport shows, hunter safety classes, and routine patrols. These interactions provide opportunities to educate the public and distribute information in regard to invasive species.
3. Conservation Officers continue to work and meet with the International Great Lakes Fishery Law Enforcement Committee, Michigan State Police Commercial Vehicle Enforcement Division, Ontario Ministry of Natural Resources, United States Coast Guard, USFWS, United States Customs, United States Border Patrol, tribal enforcement (Little River Band of Ottawa Indians, Grand Traverse Band of Ottawa and Chippewa Indians, Little Traverse Bay Bands of Odawa Indians, Sault Ste. Marie Tribe of Chippewa Indians, and Bay Mills Indian Community), and neighboring Great Lakes state law enforcement agencies. These coordinated, cooperative law enforcement efforts are vital for detecting, interdicting, and prosecuting offenders for violations of Part 413.
4. Conservation Officers continue to provide education and training to new officers within LED and outside law enforcement agencies on the following topics related to prohibited species:
  - AIS and terrestrial invasive species identification
  - Minnow identification and associated regulations
  - Modes of transportation used in the illegal marketing of live and prohibited species
  - Suspected routes/times of movement of live and prohibited species
  - 24/7 contact information for DNR law enforcement officers
5. Conservation Officers continue to conduct:
  - Retail and wholesale bait dealer inspections statewide
  - Inspections of state-licensed wholesale fish dealers
  - Random retail fish market inspections statewide
  - Inspections of commercial fishing vessels
  - Inspections of businesses dealing in live organisms



- Public education and enforcement of current regulations regarding movement of firewood, swine, and other terrestrial invasive species

In fiscal year (FY) 2014, DNR LED, in a cooperative effort with the USFWS, conducted a covert enforcement effort where minnows were purchased and water samples collected from 40 retail bait dealers throughout the state. The minnows originated from out-of-state wholesalers and were inspected for non-target and prohibited species. The water samples collected were tested for any Asian carp eDNA in a mobile lab provided by USFWS. Water samples tested negative for eDNA, and a small number of non-target species were found.

In FY 2014, MDARD conducted targeted site visits for the purpose of assuring compliance with Part 413. These sites consisted of firms which had potential to sell aquatic plants on a wholesale or retail basis, including plant growers, plant dealers, home improvement chain stores, and pet stores. Site visits were conducted statewide at 94 locations.

MDARD has also incorporated an AIS compliance monitoring component into annual nursery inspections and bi-annual inspections at nursery stock dealers. A small portion of nursery growers and dealers historically are known to carry some water garden plants in their inventory. A total of 1,168 annual grower inspections and 692 dealer inspections were conducted during FY 2014.

During the targeted site visits and routine nursery licensee inspections, inspectors checked plants in stock to determine if aquatic plants were present and to ensure compliance with Part 413. Information was provided to store managers indicating which species of plants are prohibited or restricted under NREPA.

Prohibited species were found at a total of 10 store locations. Species encountered included Carolina fanwort (*Cabomba caroliniana*) at three of the locations and parrot feather (*Myriophyllum aquaticum*) at eight of the locations. MDARD restricted the stock and ordered and witnessed the destruction of the plant material. These two species were also noted in records inspections at three additional stores; however, no plants were in stock. These examples illustrate tangible efforts being undertaken to prevent the introduction of prohibited invasive species and the importance of monitoring businesses for compliance with Part 413.

The DNR recommends continuing the above listed efforts in order to protect Michigan's citizens, resources, and economy.

## **State Department Responsibilities and Sharing Information**

The DNR and MDARD share responsibility for enforcement of violations under Part 413 and adding or deleting from the list of prohibited or restricted species. In general, the DNR is responsible for conserving, protecting, and managing the use and enjoyment of the state's natural resources, with a focus on fisheries, wildlife, parks and recreation, forests, mineral and fire management, land and facilities, and law enforcement. In particular, the DNR's Fisheries and Wildlife Divisions are leading response activities for several priority invasive plants and animals. DNR's Forest Resources Division actively works to prevent and control invasions of non-native insects and diseases that impact forest resources and habitat. In general, MDARD protects the food, agricultural, environmental, and economic interests of the citizens of Michigan and is positioned to provide expertise on emergency response. In particular, MDARD is involved in eradication of invasive insect species brought in through channels of trade. MDARD collaborates with DNR to ensure that infestations do not spread into nearby natural areas and forested areas. MDARD also monitors NREPA compliance at nursery stock sales locations and at pet and aquarium shops.

## **Educating Citizens about Prevention/Control/Eradication**

In an effort to educate citizens and provide outreach about invasive species prevention and control, the following press releases were issued by the DNR, MDARD, or Department of Environmental Quality (DEQ) during 2014:

- Michigan Revises EAB Quarantine in the Upper Peninsula (1/7/14)
- MDARD Issues Quarantine for the Invasive Balsam Woolly Adelgid (6/30/14)
- Michigan Commission on Agriculture and Rural Development Proposes Addition of Water Soldier to State's Prohibited Plant List (12/17/14)
- DNR Advises Caution to Prevent Spread of Oak Wilt Disease (4/15/14 and 7/10/14)
- White-nose Syndrome Confirmed in Bats in Michigan (4/10/14)
- Anglers Encouraged to Monitor Bait to Spot Juvenile Asian Carp (5/22/14)
- Anglers Reminded That Importing Some Baitfish is Unlawful (7/17/14)
- Bay City State Recreation Area to Remove Trees Damaged by EAB (8/5/14)
- Michigan DNR to Conduct Field Exercise with Other Great Lakes Agencies to Monitor Grass Carp on Lake Erie (9/5/14)
- Latest Round of Asian Carp eDNA Sampling on Kalamazoo River Produces Zero Positive Results (10/27/14)
- Silver Carp eDNA Detected in Lake Michigan Tributary (10/7/14)
- DNR Adds to List of Unwanted AIS (11/10/14)

In addition to these press releases, social media is often utilized to inform the public about invasive species issues. Examples include Facebook and Twitter messages

about forest pests, highlighted species, and invasive species news.

Examples of other outreach efforts include the following:

- In 2014, MDARD staff presented invasive forest pest information at 16 events, reaching over 650 people (e.g. loggers, consulting foresters, municipal foresters, landscapers, arborists, master gardeners, high school students, etc.).
- In 2014, MDARD and DNR worked together to produce three new forest pest alerts. These are in addition to three developed in 2013. The six pests now covered by the alerts include the Asian longhorned beetle, hemlock woolly adelgid, balsam woolly adelgid, oak wilt, beech bark disease, and thousand cankers disease. The alerts have been printed for distribution at education and outreach events and made available as PDFs for download on the MDARD website.
- The DNR has continued to place 'Stop Aquatic Hitchhikers' signs at state boat launches and access sites.
- A series of Best Control Practice (BCP) guides have been produced, which aid citizens in understanding the mechanisms of spread and strategies to control nine terrestrial and aquatic plant species. Additional BCPs are under development.
- The DNR held a training session for 50 DNR staff, DEQ staff, and community partners. The day-long session covered topics including prevention, detection, and control in an effort to aid staff and citizen groups in adapting better methods for invasive species management.
- The DNR gave presentations for community members to spread awareness of invasive species issues and to promote understanding of how to prevent further spread and future introductions.
- YouTube videos on the identification of priority AIS and best practices for managing these AIS were produced. Additional videos are under development.
- A Phragmites control guide was updated to serve as Michigan's primary printed material specific to Phragmites. The Phragmites control guide is distributed to partners, stakeholders, and any other interested parties.

The DNR recommends continuation of these outreach activities to increase awareness of the detrimental impacts of invasive species and the various ways to prevent their spread.

## **Simplifying Citizen Access to State Government for Compliance with Part 413**

In an effort to simplify citizen access to information regarding invasive species and increase compliance with Part 413, the DNR invasive species website ([www.michigan.gov/invasivespecies](http://www.michigan.gov/invasivespecies)) maintains an "Invasive Species Laws" page. This web page lists state and federal laws, including Part 413, and provides descriptions and photos of prohibited and restricted species. The prohibited and restricted species information is updated routinely as the status of species changes. A 'Report an Invasive' web page provides information on identification and proper protocols for reporting AIS, with specific reference to prohibited and restricted species.

In 2014, the QOL agencies (DNR, DEQ, and MDARD) created a workgroup to develop a comprehensive invasive species website. The goal behind this effort was to minimize confusion for end users on where invasive species information is housed. To date, the agencies and agency divisions have maintained separate websites for high-threat invasive species in Michigan, including mute swans, Asian carp, and feral swine. Invasive species information is also spread across other web pages, which has caused confusion among users who assume all invasive species information is encompassed within one website. The proposed QOL invasive species website is under construction and is expected to go live in 2015. The DNR recommends that each division reduce confusion by consolidating invasive species information within the QOL website and solely promoting this site in communications and messaging concerning invasive species. The website will simplify citizen access to information on the history and current state of invasive species in Michigan and provide links to current laws and regulations pertaining to these species.

To better communicate information regarding the status and distribution of invasive species to the public, the DNR is supporting the Midwest Invasive Species Information Network (MISIN), a regional database managed by Michigan State University. This database is available to agencies, partners, and the public for crowdsourcing data on invasive species locations ([www.misin.msu.edu](http://www.misin.msu.edu)). MISIN provides the ability for agencies to bulk load data at the end of a collection period. It also allows partners and citizens to use smartphone apps for both the iPhone and Android. A treatment tracking system is being developed, which will provide information regarding ongoing control efforts.

### **Legislation and Funding to Carry Out the Recommendations of the DNR and Otherwise Further the Purpose of Part 413**

Recreational users are considered to be one of the primary pathways for the movement of AIS between water bodies. To address this major pathway concern, the DNR recommends that language within Part 413 be modified to include the following regulations that apply to the transportation of water in boats and other water-related equipment by boaters from all waters in the state:

1. A person leaving waters of the state must drain all water from water-related equipment, including bait containers, live wells, and bilges, by removing the drain plug before transporting watercraft and water-related equipment.
2. Drain plugs, bailers, valves, or other devices used to control the draining of water from ballast tanks, bilges, and live wells must be removed or opened while transporting watercraft and water-related equipment.

In FY 2014, the DNR recommended that MCL 324.41303 be amended to expand the use of permits to include consumptive purposes, such as harvesting for biofuel, composting, and culinary uses, where the process is controlled in a manner which renders the organism nonviable. This recommendation was adopted in Act 537.

Historically, invasive species activities have been limited or sporadic in Michigan largely due to inadequate, short-term funding. This deficiency in funding has restricted what the state of Michigan has been able to accomplish to address invasive species strategically, holistically, and long-term. It should be recognized there are significant costs to partners, including other agencies, industries, and citizens, to prevent and manage invasive species. In the past, the DNR recommended funding commensurate with the effort needed to fully implement a comprehensive program that addresses aquatic and terrestrial invasive species. In FY 2015, significant General Fund revenues were dedicated toward addressing invasive species issues for the first time ever. The FY 2016 Executive Budget Recommendation continues the General Fund investment for invasive species efforts. This funding supports the work of all three QOL agencies by building field technical support for local units and supplying resources to on-the-ground efforts and local partners.

### **Other Matters that the DNR Considers Pertinent to the Purpose of Part 413**

The AIS Core Team continues to implement priority strategic actions in the AIS State Management Plan (SMP), several of which are highlighted in this report and include early detection and response actions, increased education and outreach, and

management and control. The AIS SMP and additional information concerning the AIS Core Team are available at [www.michigan.gov/invasivespecies](http://www.michigan.gov/invasivespecies).

The focus of this report has been heavily weighted toward aquatic organisms. Consideration and inclusion of terrestrial organisms is an integral component in building a comprehensive invasive species program for the state of Michigan. Terrestrial species, including feral swine, the Asian longhorned beetle, and a host of other terrestrial plants and animals, pose an equal threat to the native ecosystems of Michigan as aquatic invaders. The DNR recognized the need for a Terrestrial Invasive Species (TIS) Core Team and TIS SMP to develop a comprehensive management approach. In 2014, both of these ideas were implemented. A TIS Core Team was created, with multi-divisional and departmental representation. The first priority of the TIS Core Team was to develop a TIS SMP to complement the existing AIS SMP. Work began on the TIS SMP in October 2014 and is scheduled to be completed in October 2015. These efforts will help to create a comprehensive invasive species management program for the state of Michigan.

**Table 1. Species Listed as Prohibited or Restricted Under Part 413**

Species	Part 413 Status	Distribution in Michigan	Comments
<b>Plants</b>			
African oxygen weed ( <i>Lagarosiphon major</i> )	P	Absent	
Autumn Olive ( <i>Elaeagnus umbellata</i> )	P	Widespread	Common and widespread throughout the southern Lower Peninsula; widespread elsewhere statewide
Brazilian waterweed ( <i>Egeria densa</i> )	P	Absent	Isolated populations in IL, IN, MN, and OH
Curly leaf pondweed ( <i>Potamogeton crispus</i> )	R	Widespread	Common, especially in the Lower Peninsula
Cylindro ( <i>Cylindrospermopsis raciborskii</i> )	P	Isolated	Recorded in several drowned river mouths in the Lake Michigan Basin
Eurasian watermilfoil ( <i>Myriophyllum spicatum</i> )	R	Widespread	Common, especially in the Lower Peninsula
European frogbit ( <i>Hydrocharis morsusrae</i> )	P	Locally Abundant	Locally abundant in SE Lower Peninsula; isolated populations in Saginaw Bay, Alpena County, and Chippewa County
Fanwort ( <i>Cabomba caroliniana</i> )	P	Locally Abundant	Locally abundant in Lower Peninsula; present in IL, IN, OH, and ONT
Flowering rush ( <i>Butomus umbellatus</i> )	R	Locally Abundant	Dozens of observations confirmed in SE Michigan, both inland and coastal; also identified in IN, IL, MN, OH, WI, and ONT
Giant hogweed ( <i>Heracleum mantegazzianum</i> )	P	Isolated	Found scattered throughout the Lower Peninsula and western Upper Peninsula; some occurrences have been controlled
Giant salvinia ( <i>Salvinia molesta</i> , <i>auriculata</i> , <i>bilboa</i> or <i>herzogii</i> )	P	Absent	
Hydrilla ( <i>Hydrilla verticillata</i> )	P	Absent	Isolated populations in IN, WI, and OH
Japanese knotweed ( <i>Fallopia Japonica</i> )	P	Widespread	Scattered throughout Lower and Upper Peninsulas

Parrot Feather ( <i>Myriophyllum aquaticum</i> )	P	Isolated	Active management of an isolated population in Wayne County; isolated populations in IL, IN, NY, OH, and PA
Phragmites or common reed ( <i>Phragmites australis</i> )	R	Widespread	Common and established in coastal and inland areas of southern Lower Peninsula; somewhat less abundant from south to north; common in western Upper Peninsula
Purple loosestrife ( <i>Lythrum salicaria</i> )	R	Widespread	Biological control is reducing population statewide
Starry stonewort ( <i>Nitellopsis obtusa</i> )	P	Locally Abundant	Recorded in over one hundred inland waterbodies, mostly in the Lower Peninsula
Water chestnut ( <i>Trapa natans</i> )	P	Absent	Observations in NY, PA, and ONT
Water Soldier ( <i>Stratiotes aloides</i> )	P	Absent	Isolated population in ONT
Yellow floating heart ( <i>Nymphoides peltata</i> )	P	Absent	Isolated populations in IL, IN, OH, WI, and ONT
<b>Crustaceans</b>			
Rusty crayfish ( <i>Orconectes rusticus</i> )	R	Widespread	Widespread and breeding in inland waters
Red swamp crayfish ( <i>Procambarus clarkii</i> )	P	Absent	
Yabby ( <i>Cherax destructor</i> )	P	Absent	
Killer shrimp ( <i>Dikerogammarus villosus</i> )	P	Absent	
<b>Species</b>	<b>Status</b>	<b>Distribution in Michigan</b>	<b>Comments</b>
<b>Fish</b>			
Bighead carp ( <i>Hypophthalmichthys nobilis</i> )	P	Absent	
Bitterling ( <i>Rhodeus sericeus</i> )	P	Absent	
Black carp ( <i>Mylopharyngodon piceus</i> )	P	Absent	



Eurasian ruffe ( <i>Gymnocephalus cernuus</i> )	P	Locally Abundant	Patchy distribution in Great Lakes; absent in inland waters
Grass carp ( <i>Ctenopharyngodon idellus</i> )	P	Isolated	Suspected limited natural reproduction in Lake Erie; isolated detections have been reported in the St. Joseph and Kalamazoo Rivers
Ide ( <i>Leuciscus idus</i> )	P	Absent	
Japanese weatherfish ( <i>Misgurnus anguillicaudatus</i> )	P	Isolated	Single breeding population in the Shiawassee River
Round goby ( <i>Neogobius melanostomus</i> )	P	Widespread	Widespread and established in Lake Michigan, Lake Huron, and Lake Erie; isolated collection in Lake Superior near Marquette; isolated but established populations in inland waters
Rudd ( <i>Scardinius erythrophthalmus</i> )	P	Absent	Isolated collections on the Ontario side of Lake St. Clair
Silver carp ( <i>Hypophthalmichthys molitrix</i> )	P	Absent	
Snakehead family (family <i>Channidae</i> )	P	Absent	
Stone moroko ( <i>Pseudorasbora parva</i> )	P	Absent	
Tench ( <i>Tinca tinca</i> )	P	Absent	
Tubenose goby ( <i>Proterorhinus marmoratus</i> )	P	Isolated	Isolated, established populations in the St. Clair River, Lake St. Clair, Detroit River, and western Lake Erie
Wels catfish ( <i>Silurus glanis</i> )	P	Absent	
Zander ( <i>Sander lucioperca</i> )	P	Absent	
<b>Mollusks</b>			
Brown garden snail ( <i>Helix aspersa</i> )	P	Absent	Two Michigan detections in the past (both eradicated)
Carthusian snail ( <i>Monacha cartusiana</i> )	P	Locally Abundant	Wayne County
Giant African snail ( <i>Achatina fulica</i> )	P	Absent	

Girdled snail ( <i>Hygromia cinctella</i> )	P	Locally Abundant	Wayne County
Golden mussel ( <i>Limnoperna fortunei</i> )	P	Absent	
Heath snail ( <i>Xerolenta obvia</i> )	P	Locally Abundant	Lapeer County/SE Michigan
New Zealand Mudsnail ( <i>Potamopyrgus antipodarum</i> )	P	Isolated	Established in Lake Ontario and Lake Erie; at least present in Lake Superior
Quagga mussel ( <i>Dreissena bugensis</i> )	R	Widespread	Found in all of the Great lakes, although limited in Lake Superior; isolated inland occurrence in the Great Lakes basin, including a single confirmation from Michigan's Upper Peninsula
Wrinkled dune snail ( <i>Candidula intersecta</i> )	P	Locally Abundant	Wayne County
Zebra mussel ( <i>Dreissena polymorpha</i> )	R	Widespread	Widespread in inland and Great Lakes waters of the Lower Peninsula; patchy distribution in inland waters of the Upper Peninsula and Lake Superior
Species	Status	Distribution in Michigan	Comments
<b>Insects</b>			
Asian longhorned beetle ( <i>Anoplophora glabripennis</i> )	P	Absent	Not detected in Michigan; ALB infestations currently active in NY, MA, OH, and Ontario; ALB eradicated from IL and NJ
Emerald ash borer ( <i>Agilus planipennis</i> )	P	Widespread	Widespread throughout Lower Peninsula; isolated or patchy distribution across Upper Peninsula
<b>Mammals</b>			
Feral Swine ( <i>Sus scrofa Linnaeus</i> )	P	Widespread	Feral swine have been observed in 72 of 83 counties in Michigan
Nutria ( <i>Myocastor coypus</i> )	P	Absent	Farmed in Michigan in the 1930s
<b>Birds</b>			
Eurasian collared dove ( <i>Streptopelia decaocto</i> )	P	Isolated	First observed in Michigan in 2002; has since been documented in Kalamazoo, Traverse, Berrien, Alger, and Mason counties